Question Paper

Exam Date & Time: 19-Jun-2023 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
END SEMESTER THEORY EXAMINATION - MAY 2023
II SEMESTER B.Sc (Applied Sciences) in Engg.
COMPUTER ORGANIZATION AND ARCHITECTURE [ICS 123 - S2]

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

Missing data, if any, may be suitably assumed

1)	A)	Draw a neat block diagram of Functional Units of Computer. Explain in detail Primary Memory, Cache Memory and Secondary Memory and make distinction between them.	(4)
	B)	How Signed and Unsigned binary numbers are represented in Computers. Demonstrate how following operations are performed using 2s Complement methods: (a) Subtract -7 from -3 (b) Subtract +3 from +6	(4)
	C)	What are the two characteristics of RISC instruction sets? Discuss.	(2)
2)	A)	Using Booth's algorithm for 2's complement multiplication, show how to multiply the multiplicand (-7) by the multiplier (-3)	(4)
	B)	Write a RISC Assemble language code to find sum of N numbers stored in contiguous memory locations from LOC1. Store the sum in a memory location LOC2. (Give neat Flowchart)	(4)
	C)	Explain two ways of byte address assignment across words with help of neat diagrams.	(2)
3)	A)	With suitable example and diagram of data flow, explain Execute cycle of Control unit operation sequence of events.	(4)
	B)	How can we use concept of microprogramming to implement a control unit? Explain functioning of microprogrammed control unit with neat diagram.	(4)
	C)	Draw and explain horizontal and vertical microinstruction formats.	(2)
4)		Explain set associative mapping technique to determine cache locations in	(4)

	A)	which to store memory blocks.	
	B)	Explain Direct Mapping method for determining where memory blocks are placed in cache with neat diagrams.	(4)
	C)	Write a descriptive note on memory hierarchy in computer systems with neat diagram.	(2)
5)		Show how a floating-point decimal number 1300.125 is represented as Single Precision and Double precision number in computers as per IEEE standards.	(4)
	A)		
	B)	Explain the internal organization of memory chips used in computers with a diagram of 16 words of 8 bits each (16 × 8 organization).	(4)
	C)	Distinguish between write-through and write-back protocols used with cache memories.	(2)

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